

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference T8467297WO1	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEAA416)	
International application No. PCT/CA 03/01743	International filing date (<i>day/month/year</i>) 12.11.2003	Priority date (<i>day/month/year</i>) 12.11.2003
International Patent Classification (IPC) or both national classification and IPC B29C45/32		
Applicant STACKTECK SYSTEMS LTD. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 06.05.2005	Date of completion of this report 01.07.2005
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized Officer Kujat, C Telephone No. +49 89 2399-2360



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AP20R3C0757PT0 08 MAY 2006

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I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-12 as originally filed

Claims, Numbers

1-11 received on 06.05.2005 with letter of 04.05.2005

Drawings, Sheets

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

see separate sheet

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Re Item V**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: US-A-5 460 510 (GELLERT JOBST U) 24 October 1995 (1995-10-24)
D2: US-A-3 205 911 (SWICK JR GEORGE E) 14 September 1965 (1965-09-14)
D3: PATENT ABSTRACTS OF JAPAN) -& JP 58051125 (MITSUBISHI METAL CORP),
25 March 1983 (1983-03-25)

- 1.1 Document D1, which is considered to represent the most relevant state of the art, discloses (cf. figure 2) a valved cross over nozzle for an injection moulding apparatus with tapered valve seats (gate inserts 56 and 74, see figure 2 for taper) and tapered valve heads (tapered tips 98 and 126) from which the subject-matter of claim 1 differs in that the first and second valve head parts are suitable for being moved in their joined state together as one member in the same direction relative to the housing.
- 1.2 The subject-matter of claim 1 is therefore new (Article 33(2) PCT).
- 1.3 The problem to be solved by the present invention may be regarded as providing an alternative cross over nozzle arrangement with virtually no drool (see description, page 2, lines 8 to 11).
- 1.4 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:
- 1.4.1 Document D1 discloses valve heads which are tapered in opposing directions (see figure 2). In order to open the cross over nozzle, the valve heads therefore have to be moved as two members in opposing directions (compare figures 1 and 2).
- 1.4.2 While document D2 discloses a cross over nozzle with tapered valve heads (30, 60 in combination with 64) which are suitable for first being joined (see figure 2) and then being moved together as one member in the same direction (see

figure 3) relative to the housing, the nozzle of D2 is only used for refrigerating purposes. The person skilled in the art of cross over nozzles for injection moulding apparatuses would not consult the field of refrigerating in order to improve the cross over nozzle of D1.

- 1.4.3 Document D3 discloses a cross over nozzle for an injection moulding apparatus wherein first and second valve head parts (figure 1, reference numerals 5 and 8) are suitable for first being joined (see figure 1) and then being moved together as one in the same direction relative to the housing (see figure 4). However, D3 only discloses cylindrical valve seats and cylindrical valve heads. The skilled person would not replace these seats and heads with tapered ones, as disclosed in D2, since the valve heads then would not be movable as one member in the same direction any more.
- 1.5 Claim 1 defines the subject-matter in terms of the result to be achieved ("suitable for ... being moved together as one member in the same direction"), without providing the technical features necessary for achieving this result. However, claim 1 clearly stipulates that both valve seats and both valve heads are tapered. The only configuration wherein these particular valve heads are suitable for being moved together as one member in the same direction upon being joined seems to be that both valve heads (and corresponding valve seats) are tapered in the same direction (see figures 1 to 3 of the application in suit). The skilled person does not need to exercise inventive skill in order to arrive at that configuration. Therefore, claim 1 meets the requirements of Article 6 PCT in that the matter for which protection is sought is clearly defined.
2. Claims 2 to 11 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
- 3.1 The vague and imprecise statement ("spirit") in the description on page 12 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.
- 3.2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art

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disclosed in the documents D1 to D3 is not mentioned in the description, nor are these documents identified therein.

- 3.3 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1) being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- 3.4 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

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06.05.2005

CLAIMS:

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1. A valved cross over nozzle for injection molding apparatus said cross over nozzle comprising:

a nozzle housing with a melt passage extending therethrough, a valve axis extending along said passage and a tapered valve seat in said passage extending about said valve axis;

said nozzle housing having a first housing part and a second housing part separable along said valve axis through said valve seat at a housing interface, with a first valve seat part being carried by said first housing part and a second valve seat part being carried by said second housing part;

a valve member having a tapered valve head disposed in said passage and axially movable relative to said nozzle housing between a closed configuration wherein said valve head engages said valve seat to block melt flow along said passage and an open configuration wherein said valve head is displaced from said valve seat to allow melt flow along said passage about said valve head;

said valve head having a first valve head part and a second valve head part which meet at a valve interface corresponding to said nozzle interface and at which said valve member is separable along said axis into first and second valve head parts for respectively sealing said first and second nozzle parts in said closed configuration, said first and second valve head parts are suitable for first being joined and then being moved together as one member in the same direction relative to the housing;

a valve opening actuator acting between said valve member and said nozzle housing for causing simultaneous movement of said first and second valve head parts relative to said nozzle housing toward said open configuration when said first and second nozzle housing parts and first and second valve head parts are joined;

a first valve closing actuator acting between said first valve head part and said first housing part to bias said first valve part toward its closed configuration; and,

a second valve closing actuator acting between said second valve head part and said second housing part to bias at least said second valve part toward its closed configuration.

2. The cross over nozzle of claim 1 wherein:

said valve opening actuator is a fluid pressure responsive first piston in a bore associated with said first housing part;

a first valve stem extends between and operably connects said piston and said first valve head part;

said first piston further acts as said first valve closing actuator;

a fluid pressure responsive second piston in a bore associated with said second housing part acts as said second valve closing actuator; and,

a second valve stem extends between and operably connects said second piston and said second valve head part.

3. The cross over nozzle of claim 1 wherein:

said first housing part has a base part and an outer part which are telescopically connected for relative axial movement along said valve axis;

a biasing means acts between said base part and said outer part to urge said outer part away from said base part;

said first valve seat part is carried by said outer part;

a first valve stem extends between and rigidly secures said first valve head part and said base part;

said first valve head part engages said first valve seat part to limit movement of said outer part away from said inner part;

said valve opening actuator causes movement of said second housing part toward said first housing part and acts against said biasing means to urge said outer part of said first housing part toward said base part in turn causing relative movement of said valve head and said valve seat to move said valve member into said open configuration;

said biasing means between said base part and said outer part of said first housing part acts as said first valve closing actuator;

a second valve stem extends between and operably connects said second valve head part with said second closing actuator.

4. The cross over nozzle of claim 3 wherein:

said biasing means is at least one of a resilient biasing means and fluid pressure; and,

said second valve closing actuator is at least one of a resilient biasing means and a fluid pressure responsive piston in a bore associated with said second housing part.

5. The cross over nozzle housing of claim 1, 2, 3 or 4 wherein:

said first valve head part and said second valve head part are provided with cooperating locating means to align said first and second valve head parts when said first and second valve head parts are joined.

6. The cross over nozzle housing of claim 5 wherein:

said locating means include at least a projection and a corresponding recess for receiving the projection,

7. The cross over nozzle housing of claim 5 wherein:

said second housing part includes an inner part and a cover which are telescopically connected for relative movement therebetween parallel to said valve axis by an amount not exceeding a stroke of said second closing actuator;

said second valve seat part is carried by said cover;

a cushioning means acts between inner part and said cover to urge said inner part and said cover apart and yields upon joining of said first and second housing parts to cushion an initial joining impact therebetween.

8. The cross over nozzle of claim 3 wherein:

at least a portion of said first valve stem sealingly engages said first housing part; and,

said melt passage extends along an interior of said first valve stem.

9. The cross over nozzle of claim 8 wherein:

at least a portion of said second valve stem sealingly engages said second housing part; and

said melt passage extends along an interior of said second valve stem whereby in said open configuration said melt flows along said interior of said first and said second valve stems and about said valve member between said valve member and said seat.

10. The cross over nozzle of claim 9 wherein:

said melt passage extends axially along said interior of said first and second valve stems; and,

— — — said melt passage diverges toward said first valve head part and said second valve head part to exit said valve stem through at least one opening adjacent each of said first and said second valve head parts.

11. The cross over nozzle of claim 10 wherein:

said biasing means acts against a face of said mould;

said outer part, said first valve head part and said first valve stem are removable from said mould face without mould disassembly;

said second housing part has an inner section and an outer section with said second valve seat part being carried by said outer section; and,

said outer section and said inner section are separably axially joined to provide for removal of said outer section, said second valve head part and said second valve stem without mould disassembly.